

What is claimed is:

1. A method for recovering from a failure in a network, comprising:

sending a first set of information from a source to a destination via a first route;

detecting a failure along said first route;

5 in response to said failure, directing a message to said source informing said source of said failure; and

in response to said message, sending a future set of information from said source to said destination via an alternate route.

10 2. The method of claim 1, further comprising:

in response to said message, preventing other sets of information from being sent from said source to said destination via said first route.

15 3. The method of claim 1, where said first set of information comprises a data portion, and wherein said method further comprises:

in response to said message, resending at least said data portion of said first set of information from said source to said destination via said alternate route.

20 4. The method of claim 3, wherein said message comprises said data portion such that said data portion is returned to said source.

5. The method of claim 1, wherein directing a message to said source comprises:

determining a return route to said source; and  
sending said message to said source via said return route.

6. The method of claim 5, wherein determining a return route to said source  
5 comprises:  
identifying said source.

7. The method of claim 6, wherein identifying said source comprises:  
extracting from said first set of information an identifier which identifies said  
10 source.

8. The method of claim 5, wherein said first set of information comprises a  
data portion, and wherein said message comprises said data portion such that said data  
portion is returned to said source.  
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9. The method of claim 1, wherein said method is implemented on a routing  
layer of said network.

10. The method of claim 1, wherein said method is implemented within a  
20 router of said network.

11. A method, implemented within a router of a network, for recovering from  
a failure, comprising:

sending a first set of information from an ingress module to an egress module via  
a first route;

detecting a failure in said first route;

in response to said failure, directing a message to said ingress module informing  
5 said ingress module of said failure; and

in response to said message, sending a future set of information from said ingress  
module to said egress module via an alternate route.

12. The method of claim 11, wherein said first route and said alternate route  
10 are predetermined and stored within a routing table.

13. The method of claim 12, wherein sending said future set of information  
comprises:

selecting said alternate route from said routing table.

14. The method of claim 11, further comprising:

in response to said message, preventing other sets of information from being sent  
from said ingress module to said egress module via said first route.

15. The method of claim 14, wherein said first route and said alternate route  
20 are predetermined and stored within a routing table, and wherein preventing comprises:  
replacing said first route with said alternate route in said routing table.

16. The method of claim 11, wherein said first set of information comprises a data portion, and wherein said method further comprises:

in response to said message, resending at least said data portion of said first set of information from said ingress module to said egress module via said alternate route for forwarding to said destination.

17. The method of claim 16, wherein said message comprises said data portion such that said data portion is returned to said ingress module.

18. The method of claim 11, wherein directing said message to said ingress module comprises:

identifying said ingress module;

determining a return route to said ingress module; and

sending said message to said ingress module via said return route.

19. The method of claim 18, wherein identifying said ingress module comprises:

extracting from said first set of information an identifier which identifies said ingress module.

20. The method of claim 11, wherein said ingress module comprises an ingress line card, and said egress module comprises an egress line card.

21. A method, implemented within a router of a network, for recovering from a failure, comprising:

sending a first set of information from an ingress module to a first egress module for forwarding by said first egress module to a destination external to said router;

5 detecting a failure of said first egress module;

in response to said failure of said first egress module, directing a message to said ingress module informing said ingress module of said first egress module failure;

in response to said message, selecting an alternate egress module capable of forwarding information to said destination; and

10 sending a future set of information from said ingress module to said alternate egress module for forwarding to said destination.

22. The method of claim 21, wherein said first set of information and said future set of information are both part of a flow, and wherein said method further

15 comprises:

in response to said message, preventing other sets of information associated with said flow from being sent from said ingress module to said first egress module.

23. The method of claim 22, wherein said first egress module and said  
20 alternate egress module are predetermined, wherein identifiers associated with said first egress module and said alternate egress module are stored within a flow block associated with said flow, and wherein preventing comprises:

storing an indication in said flow block that all sets of information associated with said flow are not to be sent to said first egress module.

24. The method of claim 21, wherein said first set of information and said future set of information are both part of a flow, and wherein said method further comprises:

in response to said message, causing said other sets of information associated with said flow to be sent from said ingress module to said alternate egress module.

25. The method of claim 24, wherein said first egress module and said alternate egress module are predetermined, wherein identifiers associated with said first egress module and said alternate egress module are stored within a flow block associated with said flow, and wherein causing comprises:

storing an indication in said flow block that all sets of information associated with said flow are to be sent to said alternate egress module.

26. The method of claim 21, wherein said first set of information and said future set of information are both part of a flow, wherein said first egress module and said alternate egress module are predetermined, wherein identifiers associated with said first egress module and said alternate egress module are stored within a flow block associated with said flow, and wherein selecting said alternate egress module comprises:

accessing said flow block to access the identifier associated with said alternate egress module.

27. The method of claim 21, wherein said first set of information comprises a data portion, and wherein said method further comprises:

in response to said message, resending at least said data portion of said first set of  
5 information from said ingress module to said alternate egress module for forwarding to  
said destination.

28. The method of claim 27, wherein said message comprises said data  
portion such that said data portion is returned to said ingress module.

29. The method of claim 21, wherein directing said message to said ingress  
module comprises:

identifying said ingress module;

determining a return route to said ingress module; and

15 sending said message to said ingress module via said return route.

30. The method of claim 29, wherein identifying said ingress module  
comprises:

extracting from said first set of information an identifier which identifies said

20 ingress module.

31. The method of claim 21, wherein said ingress module comprises an ingress line card, said first egress module comprises a first egress line card, and said alternate egress module comprises a second egress line card.

5 32. The method of claim 21, wherein said method is implemented on a routing layer of said network.

33. A method, implemented within a router of a network, for recovering from a failure, comprising:

10 sending a first set of information from an ingress module to a first egress module for forwarding by said first egress module to a destination external to said router;

detecting an external failure beyond said first egress module;

in response to said external failure, directing a message to said ingress module informing said ingress module of said external failure;

15 in response to said message, selecting an alternate egress module capable of forwarding information to said destination; and

sending a future set of information from said ingress module to said alternate egress module for forwarding to said destination.

20 34. The method of claim 33, wherein said first set of information and said future set of information are both part of a flow, and wherein said method further comprises:



in response to said message, preventing other sets of information associated with said flow from being sent from said ingress module to said first egress module.

35. The method of claim 34, wherein said first egress module and said alternate egress module are predetermined, wherein identifiers associated with said first egress module and said alternate egress module are stored within a flow block associated with said flow, and wherein preventing comprises:

storing an indication in said flow block that all sets of information associated with said flow are not to be sent to said first egress module.

36. The method of claim 33, wherein said first set of information and said future set of information are both part of a flow, and wherein said method further comprises:

in response to said message, causing said other sets of information associated with said flow to be sent from said ingress module to said alternate egress module.

37. The method of claim 36, wherein said first egress module and said alternate egress module are predetermined, wherein identifiers associated with said first egress module and said alternate egress module are stored within a flow block associated with said flow, and wherein causing comprises:

storing an indication in said flow block that all sets of information associated with said flow are to be sent to said alternate egress module.

38. The method of claim 33, wherein said first set of information and said future set of information are both part of a flow, wherein said first egress module and said alternate egress module are predetermined, wherein identifiers associated with said first egress module and said alternate egress module are stored within a flow block associated with said flow, and wherein selecting said alternate egress module comprises:

accessing said flow block to access the identifier associated with said alternate egress module.

39. The method of claim 33, wherein said first set of information comprises a data portion, and wherein said method further comprises:

in response to said message, resending at least said data portion of said first set of information from said ingress module to said alternate egress module for forwarding to said destination.

40. The method of claim 39, wherein said message comprises said data portion such that said data portion is returned to said ingress module.

41. The method of claim 33, wherein directing said message to said ingress module comprises:

identifying said ingress module;

determining a return route to said ingress module; and

sending said message to said ingress module via said return route.

42. The method of claim 41, wherein identifying said ingress module comprises:

extracting from said first set of information an identifier which identifies said ingress module.

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43. The method of claim 33, wherein said ingress module comprises an ingress line card, said first egress module comprises a first egress line card, and said alternate egress module comprises a second egress line card.

10 44. The method of claim 33, wherein said method is implemented on a routing layer of said network.

45. The method of claim 33, wherein said external failure precludes said first egress module from forwarding said first set of information to said destination.

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46. A router, comprising:

an ingress module;

an egress module; and

a forwarding mechanism for forwarding information between said ingress module

20 and said egress module;

wherein said ingress module sends a first set of information to said forwarding mechanism to be forwarded to said egress module via a first route, said forwarding mechanism detecting a failure in said first route, and in response to said failure, said

forwarding mechanism directing a message to said ingress module informing said ingress module of said failure, and in response to said message, said ingress module sending a future set of information to said forwarding mechanism to be forwarded to said egress module via an alternate route.

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47. The router of claim 46, wherein said ingress module comprises a memory, and wherein said first route and said alternate route are predetermined and stored within a routing table in said memory.

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48. The router of claim 47, wherein said ingress module selects said alternate route from said routing table.

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49. The router of claim 46, wherein said ingress module, in response to said message, prevents other sets of information from being sent from said ingress module to said egress module via said first route.

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50. The router of claim 49, wherein said ingress module comprises a memory, wherein said first route and said alternate route are predetermined and stored within a routing table in said memory, and wherein said ingress module prevents other sets of information from being sent from said ingress module to said egress module via said first route by replacing said first route with said alternate route in said routing table.

51. The router of claim 46, wherein said first set of information comprises a data portion, and wherein said ingress module, in response to said message, resends at least said data portion of said first set of information to said forwarding mechanism to be forwarded to said egress module via said alternate route.

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52. The router of claim 51, wherein said forwarding mechanism includes said data portion in said message such that said data portion is returned by said forwarding mechanism to said ingress module.

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53. The router of claim 46, wherein said forwarding mechanism directs said message to said ingress module by:

identifying said ingress module;

determining a return route to said ingress module; and

forwarding said message to said ingress module via said return route.

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54. The router of claim 53, wherein said forwarding mechanism identifies said ingress module by extracting from said first set of information an identifier which identifies said ingress module.

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55. The router of claim 46, wherein said ingress module comprises an ingress line card, said egress module comprises an egress line card, and said forwarding mechanism comprises a switching fabric.

56. The router of claim 55, wherein said switching fabric comprises a fabric card.

57. A router, comprising:

5 an ingress module;

a first egress module;

an alternate egress module; and

a forwarding mechanism for forwarding information between said ingress module, said first egress module, and said alternate egress module;

10 wherein said ingress module sends a first set of information to said forwarding mechanism to be forwarded to said first egress module, said first set of information intended to be forwarded by said first egress module to a destination external to said router, said forwarding mechanism detecting a failure which precludes forwarding of said first set of information to said first egress module, and in response to said failure, said  
15 forwarding mechanism directing a message to said ingress module informing said ingress module of said failure, and based upon said message, said ingress module determining that said first egress module has failed, and in response to said message, said ingress module selecting said alternate egress module and sending a future set of information to said forwarding mechanism to be forwarded to said alternate egress module, said future  
20 set of information intended to be forwarded by said alternate egress module to said destination.

58. The router of claim 57, wherein said first set of information and said future set of information are both part of a flow, and wherein said ingress module, in response to said message, prevents other sets of information associated with said flow from being sent from said ingress module to said first egress module.

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59. The router of claim 58, wherein said first egress module and said alternate egress module are predetermined, wherein said ingress module comprises a memory, wherein identifiers associated with said first egress module and said alternate egress module are stored within a flow block associated with said flow, said flow block being stored in said memory, and wherein said ingress module prevents other sets of information associated with said flow from being sent from said ingress module to said first egress module by storing an indication in said flow block that all sets of information associated with said flow are not to be sent to said first egress module.

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60. The router of claim 57, wherein said first set of information and said future set of information are both part of a flow, and wherein said ingress module, in response to said message, causes said other sets of information associated with said flow to be sent from said ingress module to said alternate egress module via said forwarding mechanism.

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61. The router of claim 60, wherein said first egress module and said alternate egress module are predetermined, wherein said ingress module comprises a memory, wherein identifiers associated with said first egress module and said alternate egress

module are stored within a flow block associated with said flow, said flow block being stored in said memory, and wherein said ingress module causes said other sets of information associated with said flow to be sent from said ingress module to said alternate egress module by storing an indication in said flow block that all sets of

5 information associated with said flow are to be sent to said alternate egress module.

62. The router of claim 57, wherein said first set of information and said future set of information are both part of a flow, wherein said first egress module and said alternate egress module are predetermined, wherein said ingress module comprises a

10 memory, wherein identifiers associated with said first egress module and said alternate egress module are stored within a flow block associated with said flow, said flow block being stored in said memory, and wherein said ingress module selects said alternate egress module by accessing said flow block to access the identifier associated with said alternate egress module.

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63. The router of claim 57, wherein said first set of information comprises a data portion, and wherein said ingress module, in response to said message, resends at least said data portion of said first set of information to said forwarding mechanism to be forwarded to said alternate egress module for forwarding to said destination.

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64. The router of claim 63, wherein said forwarding mechanism includes said data portion in said message such that said data portion is returned by said forwarding mechanism to said ingress module.



65. The router of claim 57, wherein said forwarding mechanism directs said message to said ingress module by:

identifying said ingress module;

5 determining a return route to said ingress module; and

forwarding said message to said ingress module via said return route.

66. The router of claim 65, wherein said forwarding mechanism identifies said ingress module by extracting from said first set of information an identifier which

10 identifies said ingress module.

67. The router of claim 57, wherein said ingress module comprises an ingress line card, said first egress module comprises a first egress line card, said alternate egress module comprises a second egress line card, and said forwarding mechanism comprises a

15 switching fabric.

68. The router of claim 67, wherein said switching fabric comprises a fabric card.

20 69. A router, comprising:

an ingress module;

a first egress module;

an alternate egress module; and

a forwarding mechanism for forwarding information between said ingress module, said first egress module, and said alternate egress module;

wherein said ingress module sends a first set of information to said forwarding mechanism to be forwarded to said first egress module, said first set of information intended to be forwarded by said first egress module to a destination external to said router, said first egress module detecting an external failure which precludes said first egress module from forwarding said first set of information to said destination, and in response to said external failure, said first egress module directing a message to said ingress module informing said ingress module of said external failure, and in response to said message, said ingress module selecting said alternate egress module and sending a future set of information to said forwarding mechanism to be forwarded to said alternate egress module, said future set of information intended to be forwarded by said alternate egress module to said destination.

70. The router of claim 69, wherein said first set of information and said future set of information are both part of a flow, and wherein said ingress module, in response to said message, prevents other sets of information associated with said flow from being sent from said ingress module to said first egress module.

71. The router of claim 70, wherein said first egress module and said alternate egress module are predetermined, wherein said ingress module comprises a memory, wherein identifiers associated with said first egress module and said alternate egress module are stored within a flow block associated with said flow, said flow block being

stored in said memory, and wherein said ingress module prevents other sets of information associated with said flow from being sent from said ingress module to said first egress module by storing an indication in said flow block that all sets of information associated with said flow are not to be sent to said first egress module.

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72. The router of claim 69, wherein said first set of information and said future set of information are both part of a flow, and wherein said ingress module, in response to said message, causes said other sets of information associated with said flow to be sent from said ingress module to said alternate egress module via said forwarding mechanism.

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73. The router of claim 72, wherein said first egress module and said alternate egress module are predetermined, wherein said ingress module comprises a memory, wherein identifiers associated with said first egress module and said alternate egress module are stored within a flow block associated with said flow, said flow block being stored in said memory, and wherein said ingress module causes said other sets of information associated with said flow to be sent from said ingress module to said alternate egress module by storing an indication in said flow block that all sets of information associated with said flow are to be sent to said alternate egress module.

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74. The router of claim 69, wherein said first set of information and said future set of information are both part of a flow, wherein said first egress module and said alternate egress module are predetermined, wherein said ingress module comprises a

memory, wherein identifiers associated with said first egress module and said alternate egress module are stored within a flow block associated with said flow, said flow block being stored in said memory, and wherein said ingress module selects said alternate egress module by accessing said flow block to access the identifier associated with said

5 alternate egress module.

75. The router of claim 69, wherein said first set of information comprises a data portion, and wherein said ingress module, in response to said message, resends at least said data portion of said first set of information to said forwarding mechanism to be

10 forwarded to said alternate egress module for forwarding to said destination.

76. The router of claim 75, wherein said first egress module includes said data portion in said message such that said data portion is returned by said first egress module to said ingress module.

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77. The router of claim 69, wherein said first egress module directs said message to said ingress module by:

identifying said ingress module;

determining a return route to said ingress module; and

20 forward said message to said ingress module via said return route.

78. The router of claim 77, wherein said first egress module identifies said ingress module by extracting from said first set of information an identifier which identifies said ingress module.

5 79. The router of claim 69, wherein said ingress module comprises an ingress line card, said first egress module comprises a first egress line card, said alternate egress module comprises a second egress line card, and said forwarding mechanism comprises a switching fabric.

10 80. The router of claim 79, wherein said switching fabric comprises a fabric card.

81. A method implemented by a forwarding mechanism in a router, comprising:

15 receiving a set of information sent by an ingress module intended to be forwarded to an egress module via a particular route;

detecting a failure in said particular route; and

in response to said failure, directing a message to said ingress module informing said ingress module of said failure.

20 82. The method of claim 81, wherein said set of information comprises a data portion, and wherein directing said message to said ingress module comprises:

returning said data portion to said ingress module.

83. The method of claim 81, wherein said set of information comprises a data portion, and wherein directing said message to said ingress module comprises:

including said data portion in said message such that said data portion is returned  
5 to said ingress module.

84. The method of claim 81, wherein directing said message to said ingress module comprises:

identifying said ingress module;  
10 determining a return route to said ingress module; and  
sending said message to said ingress module via said return route.

85. The method of claim 84, wherein identifying said ingress module comprises:

15 extracting from said first set of information an identifier which identifies said ingress module.

86. The method of claim 84, wherein determining said return route comprises:

accessing a routing table which comprises one or more routes to said ingress  
20 module; and

obtaining said return route from said routing table.

87. A forwarding mechanism in a router, comprising:

a mechanism for receiving a set of information sent by an ingress module intended to be forwarded to an egress module via a particular route;

a mechanism for detecting a failure in said particular route; and

a mechanism for directing, in response to said failure, a message to said ingress

5 module informing said ingress module of said failure.

88. The forwarding mechanism of claim 87, wherein said set of information comprises a data portion, and wherein the mechanism for directing said message to said ingress module comprises:

10 a mechanism for returning said data portion to said ingress module.

89. The forwarding mechanism of claim 87, wherein said set of information comprises a data portion, and wherein the mechanism for directing said message to said ingress module comprises:

15 a mechanism for including said data portion in said message such that said data portion is returned to said ingress module.

90. The forwarding mechanism of claim 87, wherein the mechanism for directing said message to said ingress module comprises:

20 a mechanism for identifying said ingress module;

a mechanism for determining a return route to said ingress module; and

a mechanism for sending said message to said ingress module via said return route.

91. The forwarding mechanism of claim 90, wherein the mechanism for identifying said ingress module comprises:

5 a mechanism for extracting from said first set of information an identifier which identifies said ingress module.

92. The forwarding mechanism of claim 90, wherein said forwarding mechanism further comprises a memory for storing a routing table which comprises one or more routes to said ingress module, and wherein the mechanism for determining said  
10 return route comprises:

a mechanism for accessing said routing table in said memory; and

a mechanism for obtaining said return route from said routing table.

93. A method implemented by an egress module in a router, comprising:  
15 receiving a set of information sent by an ingress module intended to be forwarded by the egress module to a destination external to the router;

detecting a failure external to the router which precludes the egress module from forwarding said set of information to said destination; and

in response to said failure, directing a message to said ingress module informing  
20 said ingress module of said failure.

94. The method of claim 93, wherein said set of information comprises a data portion, and wherein directing said message to said ingress module comprises:



returning said data portion to said ingress module.

95. The method of claim 93, wherein said set of information comprises a data portion, and wherein directing said message to said ingress module comprises:

5 including said data portion in said message such that said data portion is returned to said ingress module.

96. The method of claim 93, wherein directing said message to said ingress module comprises:

10 identifying said ingress module;  
determining a return route to said ingress module; and  
sending said message to said ingress module via said return route.

97. The method of claim 96, wherein identifying said ingress module  
15 comprises:

extracting from said first set of information an identifier which identifies said ingress module.

98. The method of claim 96, wherein determining said return route comprises:

20 accessing a routing table which comprises one or more routes to said ingress module; and

obtaining said return route from said routing table.

99. An egress module in a router, comprising:

a mechanism for receiving a set of information sent by an ingress module intended to be forwarded by said egress module to a destination external to the router;

a mechanism for detecting a failure external to the router which precludes said egress module from forwarding said set of information to said destination; and  
a mechanism for directing, in response to said failure, a message to said ingress module informing said ingress module of said failure.

100. The egress module of claim 99, wherein said set of information comprises a data portion, and wherein the mechanism for directing said message to said ingress module comprises:

a mechanism for returning said data portion to said ingress module.

101. The egress module of claim 99, wherein said set of information comprises a data portion, and wherein the mechanism for directing said message to said ingress module comprises:

a mechanism for including said data portion in said message such that said data portion is returned to said ingress module.

102. The egress module of claim 99, wherein the mechanism for directing said message to said ingress module comprises:

a mechanism for identifying said ingress module;

a mechanism for determining a return route to said ingress module; and

a mechanism for sending said message to said ingress module via said return route.

103. The egress module of claim 102, wherein the mechanism for identifying  
5 said ingress module comprises:

a mechanism for extracting from said first set of information an identifier which identifies said ingress module.

104. The egress module of claim 102, wherein said egress module further  
10 comprises a memory for storing a routing table which comprises one or more routes to said ingress module, and wherein the mechanism for determining said return route comprises:

a mechanism for accessing said routing table in said memory; and

a mechanism for obtaining said return route from said routing table.

105. A method implemented by an ingress module in a router, comprising:  
sending a first set of information to an egress module via a first route, said first set  
of information intended to be forwarded by the egress module to a destination external to  
the router;

20 receiving a message indicating that said first set of information did not reach the destination successfully;

determining based upon said message whether future sets of information should be sent to the egress module; and

in response to a determination that future sets of information should be sent to the egress module, sending a future set of information to the egress module via an alternate route.

5           106.   The method of claim 105, wherein it is determined that future sets of information should be sent to the egress module if: (a) said message does not indicate that the egress module has failed; and (2) said message does not indicate that an external failure, which would preclude the egress module from forwarding said first set of information to the destination, has occurred.

10           107.   The method of claim 105, wherein said first route and said alternate route are predetermined and stored within a routing table, and wherein sending said future set of information to the egress module comprises:

selecting said alternate route from said routing table.

15           108.   The method of claim 105, further comprising:  
in response to a determination that future sets of information should be sent to the egress module, preventing said future sets of information from being sent to the egress module via said first route.

20           109.   The method of claim 108, wherein said first route and said alternate route are predetermined and stored within a routing table, and wherein preventing comprises:  
replacing said first route with said alternate route in said routing table.

110. The method of claim 105, wherein said first set of information comprises a data portion, and wherein said method further comprises:

in response to a determination that future sets of information should be sent to the egress module, resending at least said data portion of said first set of information to the egress module via said alternate route.

111. The method of claim 110, wherein said message indicating that said first set of information did not reach the destination successfully comprises said data portion of said first set of information.

112. A method implemented by an ingress module in a router, comprising:  
sending a first set of information to a first egress module, said first set of information intended to be forwarded by the first egress module to a destination external to the router;

receiving a message indicating that said first set of information did not reach the destination successfully;

determining based upon said message whether future sets of information should be sent to the first egress module; and

in response to a determination that future sets of information should not be sent to the first egress module, selecting an alternate egress module capable of forwarding information to the destination; and

sending a future set of information to the alternate egress module to be forwarded by the alternate egress module to the destination.

113. The method of claim 112, wherein it is determined that future sets of information should not be sent to the egress module if: (a) said message indicates that the first egress module has failed; or (2) said message indicates that an external failure, which would preclude the first egress module from forwarding said first set of information to the destination, has occurred.

114. The method of claim 112, wherein said first set of information and said future set of information are both part of a flow, and wherein said method further comprises:

in response to a determination that future sets of information should not be sent to the first egress module, preventing other sets of information associated with said flow from being sent to the first egress module.

115. The method of claim 114, wherein said first egress module and said alternate egress module are predetermined, wherein identifiers associated with said first egress module and said alternate egress module are stored within a flow block associated with said flow, and wherein preventing comprises:

storing an indication in said flow block that all sets of information associated with said flow are not to be sent to the first egress module.

116. The method of claim 112, wherein said first set of information and said future set of information are both part of a flow, and wherein said method further comprises:

in response to a determination that future sets of information should not be sent to  
5 the first egress module, causing other sets of information associated with said flow to be sent to the alternate egress module.

117. The method of claim 116, wherein said first egress module and said alternate egress module are predetermined, wherein identifiers associated with said first  
10 egress module and said alternate egress module are stored within a flow block associated with said flow, and wherein causing comprises:

storing an indication in said flow block that all sets of information associated with said flow are to be sent to the alternate egress module.

118. The method of claim 112, wherein said first set of information and said future set of information are both part of a flow, wherein said first egress module and said alternate egress module are predetermined, wherein identifiers associated with said first  
15 egress module and said alternate egress module are stored within a flow block associated with said flow, and wherein selecting the alternate egress module comprises:

20 accessing said flow block to access the identifier associated with the alternate egress module.

119. The method of claim 112, wherein said first set of information comprises a data portion, and wherein said method further comprises:

in response to a determination that future sets of information should not be sent to the first egress module, resending at least said data portion of said first set of information to the alternate egress module to be forwarded by the alternate egress module to the destination.

120. The method of claim 119, wherein said message indicating that said first set of information did not reach the destination successfully comprises said data portion of said first set of information.

121. An ingress module in a router, comprising:

a mechanism for sending a first set of information to an egress module via a first route, said first set of information intended to be forwarded by the egress module to a destination external to the router;

a mechanism for receiving a message indicating that said first set of information did not reach the destination successfully;

a mechanism for determining based upon said message whether future sets of information should be sent to the egress module; and

a mechanism for sending, in response to a determination that future sets of information should be sent to the egress module, a future set of information to the egress module via an alternate route.



122. The ingress module of claim 121, wherein it is determined that future sets of information should be sent to the egress module if: (a) said message does not indicate that the egress module has failed; and (2) said message does not indicate that an external failure, which would preclude the egress module from forwarding said first set of  
5 information to the destination, has occurred.

123. The ingress module of claim 121, wherein said ingress module comprises a memory, wherein said first route and said alternate route are predetermined and stored within a routing table in said memory, and wherein the mechanism for sending said  
10 future set of information to the egress module comprises:

a mechanism for selecting said alternate route from said routing table.

124. The ingress module of claim 121, further comprising:  
a mechanism for preventing, in response to a determination that future sets of  
15 information should be sent to the egress module, said future sets of information from being sent to the egress module via said first route.

125. The ingress module of claim 124, wherein said ingress module comprises a memory, wherein said first route and said alternate route are predetermined and stored  
20 within a routing table in said memory, and wherein the mechanism for preventing comprises:

a mechanism for replacing said first route with said alternate route in said routing table.

126. The ingress module of claim 121, wherein said first set of information comprises a data portion, and wherein said ingress module further comprises:

5 a mechanism for resending, in response to a determination that future sets of information should be sent to the egress module, at least said data portion of said first set of information to the egress module via said alternate route.

127. The ingress module of claim 126, wherein said message indicating that said first set of information did not reach the destination successfully comprises said data  
10 portion of said first set of information.

128. An ingress module in a router, comprising:

a mechanism for sending a first set of information to a first egress module, said first set of information intended to be forwarded by the first egress module to a  
15 destination external to the router;

a mechanism for receiving a message indicating that said first set of information did not reach the destination successfully;

a mechanism for determining based upon said message whether future sets of information should be sent to the first egress module; and

20 a mechanism for selecting, in response to a determination that future sets of information should not be sent to the first egress module, an alternate egress module capable of forwarding information to the destination; and

a mechanism for sending a future set of information to the alternate egress module to be forwarded by the alternate egress module to the destination.

129. The ingress module of claim 128, wherein it is determined that future sets of information should not be sent to the egress module if: (a) said message indicates that the first egress module has failed; or (2) said message indicates that an external failure, which would preclude the first egress module from forwarding said first set of information to the destination, has occurred.

130. The ingress module of claim 128, wherein said first set of information and said future set of information are both part of a flow, and wherein said ingress module further comprises:

a mechanism for preventing, in response to a determination that future sets of information should not be sent to the first egress module, other sets of information associated with said flow from being sent to the first egress module.

131. The ingress module of claim 130, wherein said ingress module comprises a memory, wherein the first egress module and the alternate egress module are predetermined, wherein identifiers associated with the first egress module and the alternate egress module are stored within a flow block associated with said flow, said flow block being stored in said memory, and wherein the mechanism for preventing comprises:

a mechanism for storing an indication in said flow block that all sets of information associated with said flow are not to be sent to the first egress module.

132. The ingress module of claim 128, wherein said first set of information and  
5 said future set of information are both part of a flow, and wherein said ingress module further comprises:

a mechanism for causing, in response to a determination that future sets of information should not be sent to the first egress module, other sets of information associated with said flow to be sent to the alternate egress module.

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133. The ingress module of claim 132, wherein said ingress module comprises a memory, wherein the said first egress module and the alternate egress module are predetermined, wherein identifiers associated with the first egress module and the alternate egress module are stored within a flow block associated with said flow, said  
15 flow block being stored in said memory, and wherein the mechanism for causing comprises:

a mechanism for storing an indication in said flow block that all sets of information associated with said flow are to be sent to the alternate egress module.

20 134. The ingress module of claim 128, wherein said ingress module comprises a memory, wherein said first set of information and said future set of information are both part of a flow, wherein the first egress module and the alternate egress module are predetermined, wherein identifiers associated with the first egress module and the

alternate egress module are stored within a flow block associated with said flow, said flow block being stored in said memory, and wherein the mechanism for selecting the alternate egress module comprises:

- 5 a mechanism for accessing said flow block to access the identifier associated with the alternate egress module.

135. The ingress module of claim 128, wherein said first set of information comprises a data portion, and wherein said ingress module further comprises:

- 10 a mechanism for resending, in response to a determination that future sets of information should not be sent to the first egress module, at least said data portion of said first set of information to the alternate egress module to be forwarded by the alternate egress module to the destination.

- 136. The ingress module of claim 135, wherein said message indicating that  
15 said first set of information did not reach the destination successfully comprises said data portion of said first set of information.